WHITE PINE BARK ADULTERATED WITH ELM BARK.

BY C. O. EWING.

White pine (*Pinus alba* L.) bark is a drug concerning which we have found no previous record of adulteration. Its appearance is so characteristic that even a novice is not apt to mistake other barks for it. Furthermore, it is generally so cheap that it is not a likely subject for wilful adulteration. However, during the war an unusually strong demand arose which enhanced its market value. This may have occasioned the case of obviously intentional adulteration which we have recently observed.

A shipment received from North Carolina but collected in Michigan contained a 160-pound bale the outer part of which to the depth of about one foot consisted of genuine white pine, the interior, however, consisted almost entirely of rossed outer elm bark (*Ulmus fulva* L.). The official N. F. "Ulmus" consists of inner bark from which the outer layer has been removed, since the latter is practically devoid of mucilage cells to which the inner portion owes its virtues. The bark in question consisted mostly of cut pieces about 2 to 10 cm. wide and about 5 to 50 cm. long. The outer corky layer had been removed; where the rossing had been superficial the outer surface had a somewhat reticulated appearance. In other respects the adulterant somewhat resembled the official elm bark except that it was sometimes thicker and slightly quilled. The fracture was short except in instances where a very thin layer of inner bark was stilled attached. It had the fenugreek-like odor characteristic of elm bark.

While the appearance of the adulterant, except as regards color, was only remotely suggestive of white pine and should normally be detected, it is conceivable that other bales similarly adulterated may have found access to the market in a ground or powdered state, and we have, therefore, deemed it advisable to call our observation to the attention of the trade. Fortunately, the monoclinic prisms of calcium oxalate characteristic of elm bark are so striking that its presence can readily be detected by microscopic examination.

ANALYTICAL & RESEARCH LABORATORY,
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ANALYSIS OF SOLUTION OF MAGNESIUM CITRATE.*

BY JOSEPH L. MAYER.

This paper presents methods of assay for solution of magnesium citrate, devised with a view of modifying the U. S. P. method without sacrificing accuracy, which are more expeditious and provide for the use of less elaborate apparatus than is commonly thought necessary for making gravimetric determinations.

(*a*) A bottle of Solution of Magnesium Citrate, obtained in the open market, was analyzed for its magnesium content by the following method, which is that of the U. S. P.

"Transfer 10 mils of solution of magnesium citrate, accurately measured, to a platinum or porcelain dish, evaporate to dryness, and ignite until most of the carbonaceous matter has

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burned off. Add to the residue 20 mils of diluted hydrochloric acid, heat on a water bath for fifteen minutes, filter if necessary and wash the residue thoroughly with hot water. To the combined filtrate and washings, which should measure about 100 mils, add an excess of sodium phosphate T. S. (about 20 mils) then add ammonia water gradually, with constant stirring, until slightly alkaline, allow to stand for ten minutes; add 30 mils of ammonia water, and allow to stand for twelve hours. Collect the precipitate on a filter, wash it with dilute ammonia water (1 volume of ammonia water to 3 volumes of water) until 10 mils of the washings, when acidulated with nitric acid, yield not more than an opalescence on the addition of a few drops of silver nitrate T. S. Dry and ignite to constant weight."

Before measuring the 10 Cc. required in the analysis, the solution was poured back and forth from one vessel to another until the gas was expelled and in this manner it was easy to measure the quantity of solution to be assayed. The U. S. P. neglects to call attention to the necessity of freeing the solution of gas before measuring; if this is not done it is impossible to accurately measure the solution. The ammonium magnesium phosphate was collected on asbestos in a Gooch crucible employing suction to filter; the precipitate was heated over an ordinary Bunsen burner and over a Meker burner and the results were identical.

The analysis showed the presence of 1.567 grammes MgO per 100 Cc. The solution was evaporated and ignited in a platinum dish such as is employed for milk analyses. It is practically impossible to successfully make the analysis unless platinum is employed, but realizing the fact that students and pharmacists are not provided with platinum ware and that even though the Pharmacopoeial directions for the assay make it optional to use porcelain, I made another analysis in which evaporation and ignition were omitted but instead the following method was employed:

(*b*) Ten Cc. of the gas-free Solution of Magnesium Citrate was added to a beaker which contained diluted hydrochloric acid and about 80 Cc. water and from this stage the U. S. P. method was followed.

The precipitate was filtered through asbestos on a Gooch crucible employing suction, after which it was heated over a Bunsen burner. The analysis showed the presence of 1.600 grammes MgO per 100 Cc.

(*c*) Another 10 Cc. of the solution was then measured and the analysis carried out as under (*b*) with the exception of the fact that in place of filtering through asbestos in a Gooch crucible a 9 cm. Baker and Adamson quantitative filter paper was employed. The analysis showed the presence of 1.636 grammes of MgO per 100 Cc.

(*d*) Ten Cc. of the solution analyzed by method (*b*) employing qualitative filter paper to filter the precipitate on and making all weights on a Torsion Balance showed the presence of 1.575 grammes MgO per 100 Cc.

(*e*) Ten Cc. of the solution analyzed by method (*b*) but employing qualitative filter paper and making all weights on a hand scale such as is employed by students showed the presence of 1.629 grammes of MgO per 100 Cc. The conditions here were practically those under which students in large sections work.

(*f*) Ten Cc. of the sample analyzed by method (*b*) modified to allow the material to stand only 4 hours instead of 12 hours as directed by the Pharmacopoeia showed the presence of 1.650 grammes MgO per 100 Cc.

(*g*) Following the suggestion of Schmitz (Treadwell and Hall's "Quantitative Analysis," Vol. 2, 4th edition, page 434) for the estimation of phosphoric acid by means of magnesium mixture, 10 Cc. Solution of Magnesium Citrate were placed in a beaker, 15 Cc. saturated solution of ammonium chloride were added, the solution acidified with hydrochloric acid, 15 Cc. sodium phosphate solution added and the whole heated to boiling; 2.5 percent ammonia was then added very slowly with constant stirring until a precipitate began to form and then the addition of the ammonia was regulated so that about 4 drops were added per minute until the odor of ammonia persisted. The solution was then allowed to cool, one-fifth of its volume of concentrated ammonia was added and at the end of ten minutes the material was filtered through asbestos in a Gooch crucible using suction. The washing, drying and ignition was conducted as in the other analyses. The analysis showed the presence of 1.531 grammes MgO per 100 Cc.

The following is a summary of results by the various methods:

(*a*) 1.567 grammes MgO per 100 Cc.
(*b*) 1.600 grammes MgO per 100 Cc.
(*c*) 1.636 grammes MgO per 100 Cc.
(*d*) 1.575 grammes MgO per 100 Cc.
(*e*) 1.629 grammes MgO per 100 Cc.
(*f*) 1.650 grammes MgO per 100 Cc.
(*g*) 1.531 grammes MgO per 100 Cc.

The mean of these results is 1.595.

CONCLUSIONS.

(1) These results clearly indicate that pharmacists and students who lack the facilities of the well-equipped laboratory can with the apparatus at hand in the drug store or laboratory, secure results which are practically the same as those obtained by the employment of more elaborate apparatus.

(2) That if necessary, the time required to make the assay can be much shortened.

(3) That the results obtained are practically the same whether the magnesium is determined in the original sample or in the ash resulting from evaporation and ignition.

(4) That it is more convenient and consumes less time to determine the magnesium in the original sample.

RESEARCH & ANALYTICAL LABORATORIES
OF THE
LOUIS K. LIGGETT CO.

THE STANDARDIZATION OF VETERINARY BLISTERING OINTMENTS.

BY GEORGE E. ÉWE.

The proportion of active ingredients in a veterinary blistering ointment as determined by chemical analysis, is not in direct ratio to the blistering power of the ointment. The reason for this is, that while analysis reveals the total amount of active ingredients, yet, only the effect of a variable and sub-total amount of the active ingredients is exerted in the actual blistering operation. The effect of the total amount of the active ingredients is impractical of attainment, because of the limitations surrounding the employment of a product, requiring contact in its use.

Since chemical analysis is not in direct ratio to the blistering power of ointments, a system of chemical and physical control of manufacture coupled with physiologic tests on the finished product is to be preferred.

CHEMICAL CONTROL OF MANUFACTURE OF BLISTERING OINTMENTS.

This consists essentially of analytical chemical control of the strength and purity of the ingredients used in manufacture. Some of the more commonly employed active substances are Cantharides (both Russian and Spanish variety), *Mylabris Cichorii* (or Chinese Blistering Fly), turpentine, glacial acetic acid, and red mercuric iodide.